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Electric Vehicle Supply Equipment

Identifying Key Elements of Interoperability

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CEC EVSE Interoperability Staff Workshop
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Contents

- What are the key interfaces for networked public plug in vehicle charging infrastructure that help to ensure interoperability?
  - A discussion of four interfaces

Some acronyms you might hear me use…

- EVSE – Electric Vehicle Supply Equipment – the Charge Station
- EVSP – Electric Vehicle Service Provider – the Network Provider
- RFID – radio frequency identification – a plastic card or dongle that identifies a user (often a fob on your key chain)

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A Cautionary Tale from Hawaii…

- Better Place installed a network of 77 EVSE stations in Hawaii
- >800 drivers subscribed to the Better Place Service *[1]*
  - They were provided RFID dongles
- Better Place sells network to OpConnect (Mar 2013)
- Better Place declared bankruptcy (May 2013)
- OpConnect now manages the network, but doesn't have access to the RFID dongles (which were proprietary)
  - Only users that already have the dongles can use the network right now (about 100 drivers *want* to use the network, but can't); service is being offered for free in the interim
- The fix - OpConnect plans to remove the Better Place EVSEs and replace their with their own EVSE – no mention of cost and schedule is "soon"

[1] Honolulu Civil Beat, July 23, 2013

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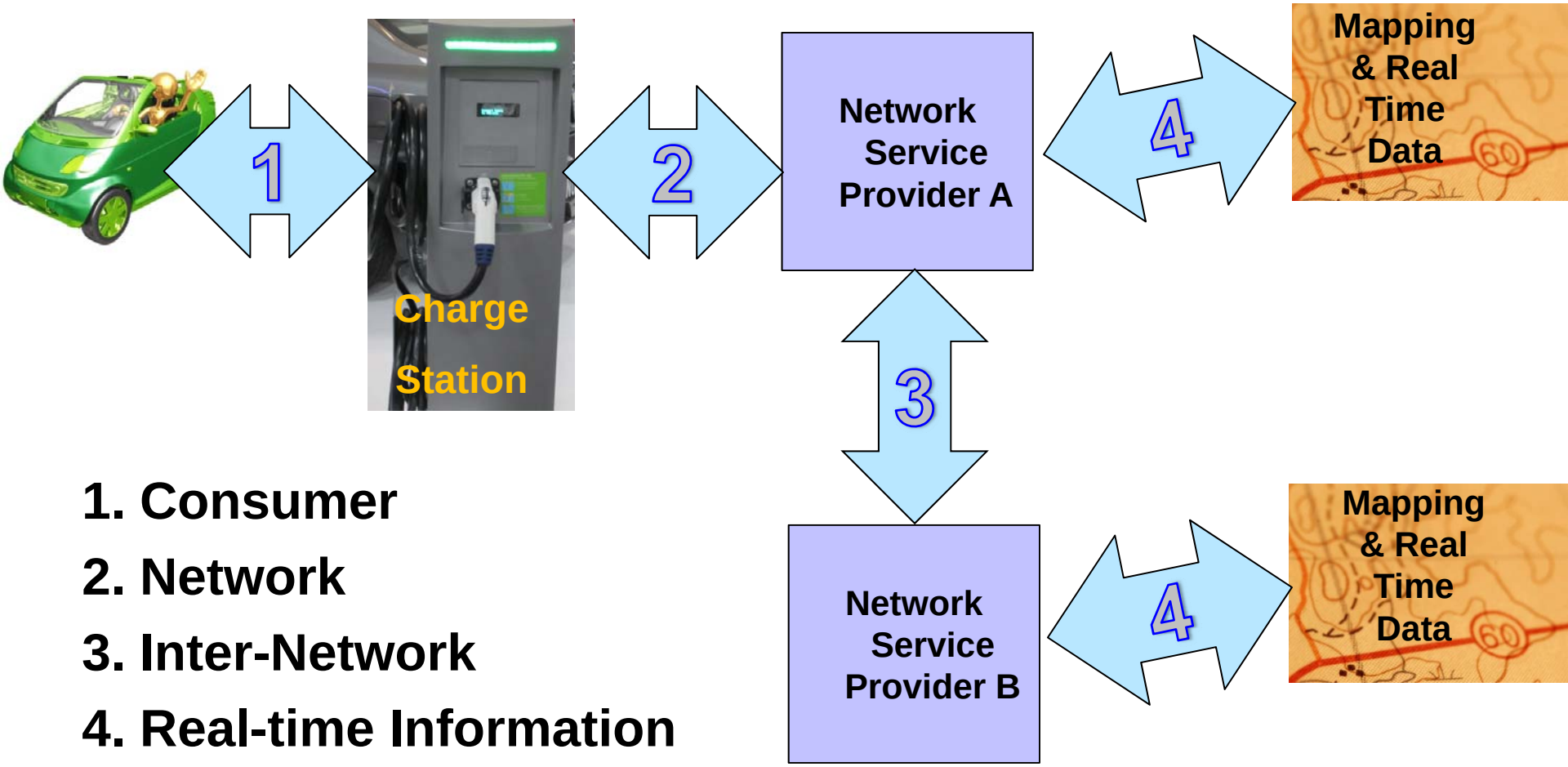
The Key Interfaces for Public Charging



1. Consumer
2. Network
3. Inter-Network
4. Real-time Information

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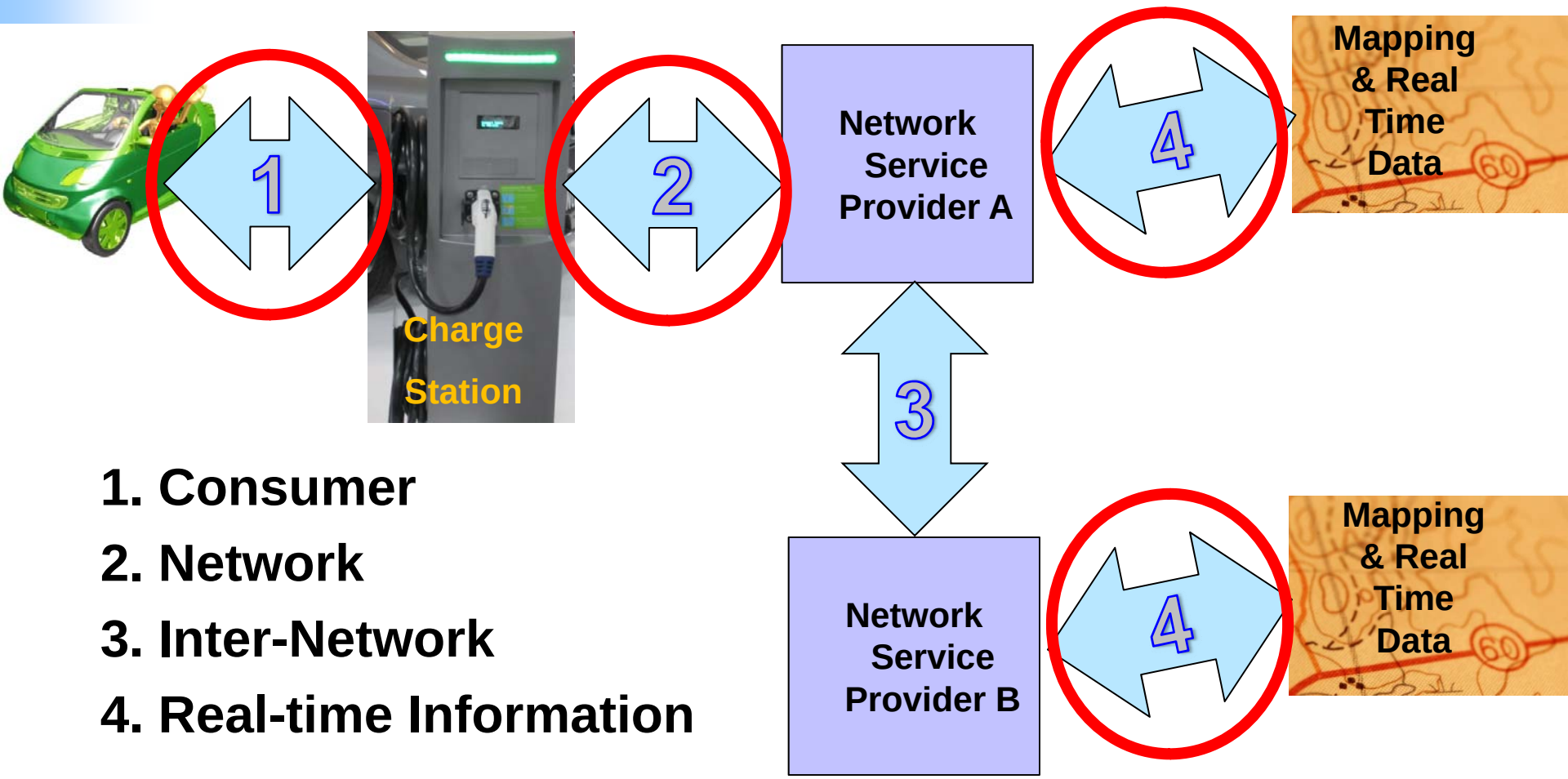
The Key Interfaces for Public Charging



1. Consumer
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Currently – These are Proprietary

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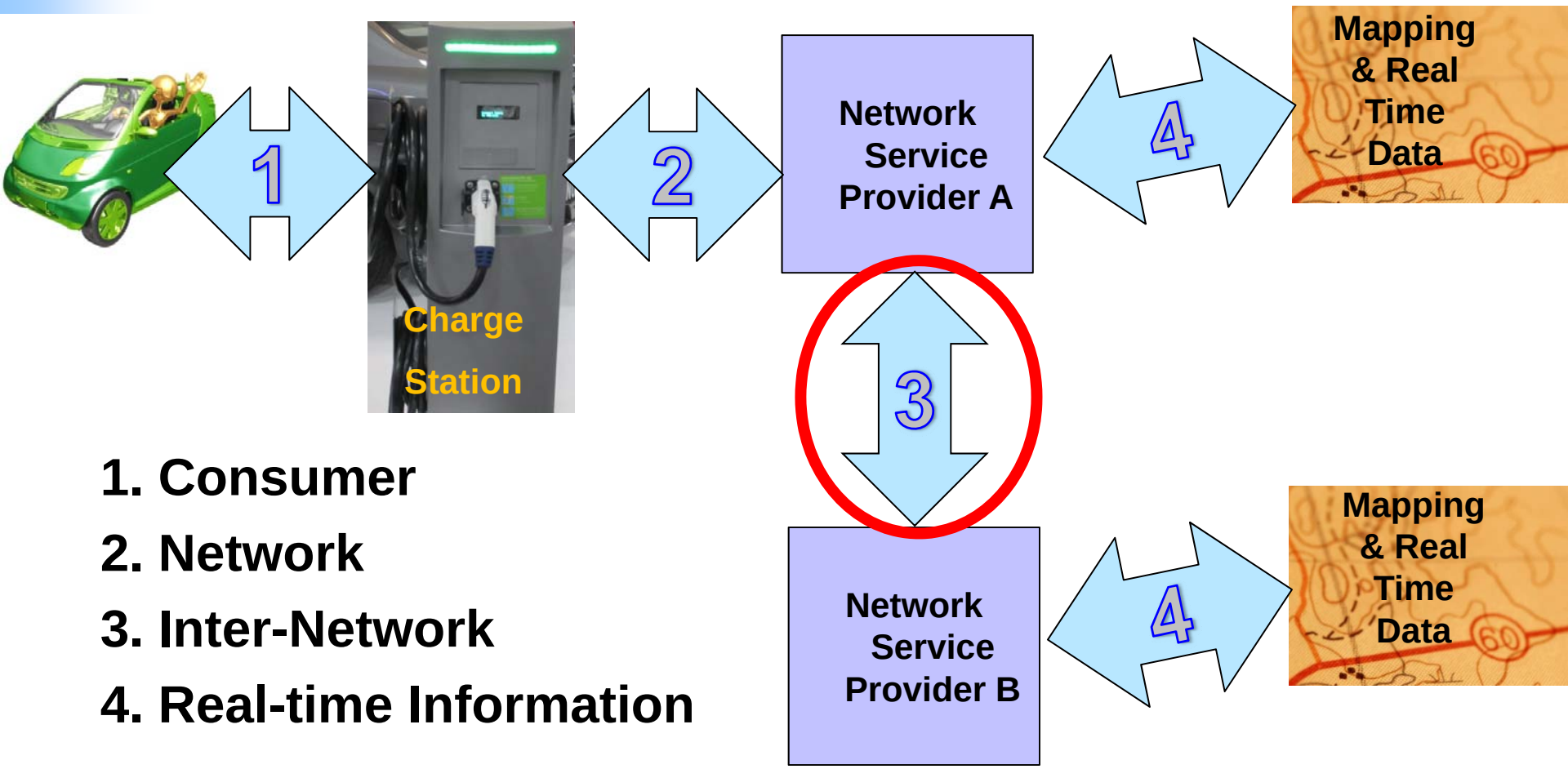
The Key Interfaces for Public Charging



1. Consumer
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Currently – This Interface Doesn't Exist

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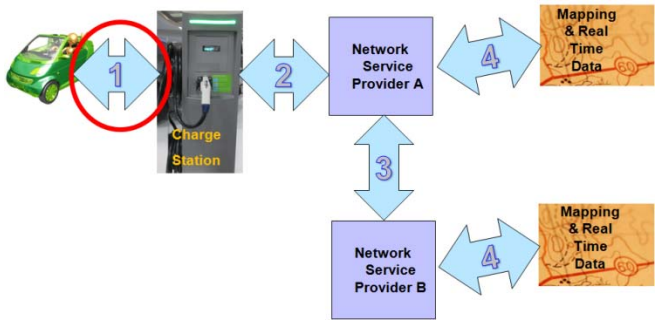
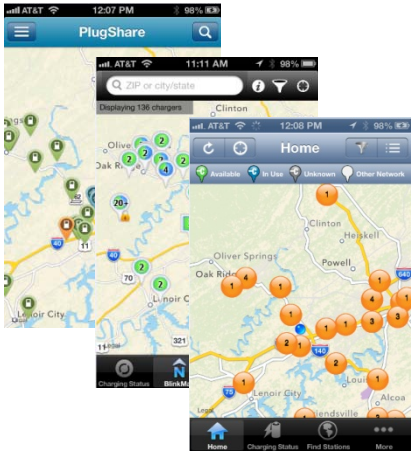
1. The Consumer Interface



- Authenticates user
- Enables payment collection
- Many forms:
  - Phone app
    - Log-in
    - Scan a QR code
  - Credit card
    - Non-contact
    - Swipe
  - Call a Phone Number
  - RFID card
  - Key fob/dongle
  - PIN number



How many cards/dongles/phone apps/PIN numbers do I need?

Do all public EVSEs need to be on a network?

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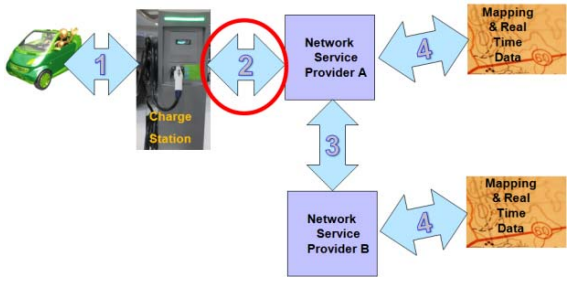
2. The Network



- This connection supports data flow between the charge stations (EVSE) and the network operator (EVSP)
  - User authentication; Payment; Station management
- Often uses public internet (via cellular modem or a wired connection)
- Might support other services
  - Maintenance
  - Data collection
  - Advertising

A Proprietary Network Means:

Selection of a charge station is limited to those that support a particular Network

Installed charge stations are locked to only those networks they can support

- Europe has widely deployed a standard network interface called the "Open Charge Point Protocol" – OCPP. This enables any OCCP-based charging station to use any OCCP based network; a site owner is not locked in to specific network provider

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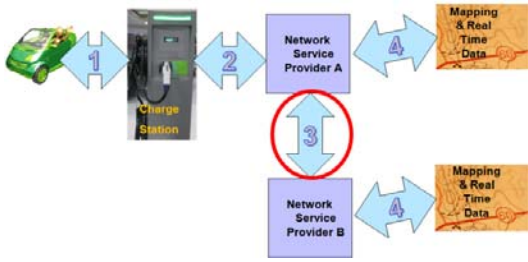
3. The Inter-Network Interface



- Currently consumers must have an account with each network provider they wish to use
- Linking networks would allow consumers to roam across networks but receive a single bill
- If this link included **all** network providers, then consumers need only carry one set of credentials
- Offers potential for combined real-time data and mapping
- This link does not exist today
  - Two network vendors (ChargePoint and ECOtality) announced formation of Collaboratev, an organization designed to fill this role (http://www.collaboratev.com/)

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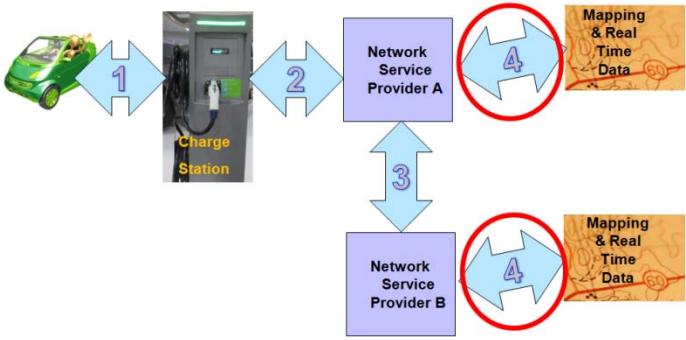
4. REAL-TIME INFORMATION



- Enables mapping applications that include all network brands
- Ability to make a station reservation across networks from one application
- Consumer won't have to consult several maps to see all charge station options
- Collaboratev plans to provide unified mapping
  - Would only support members of Collaboratev

Link for third parties to see Network data – primarily station status for map applications and potentially reservations

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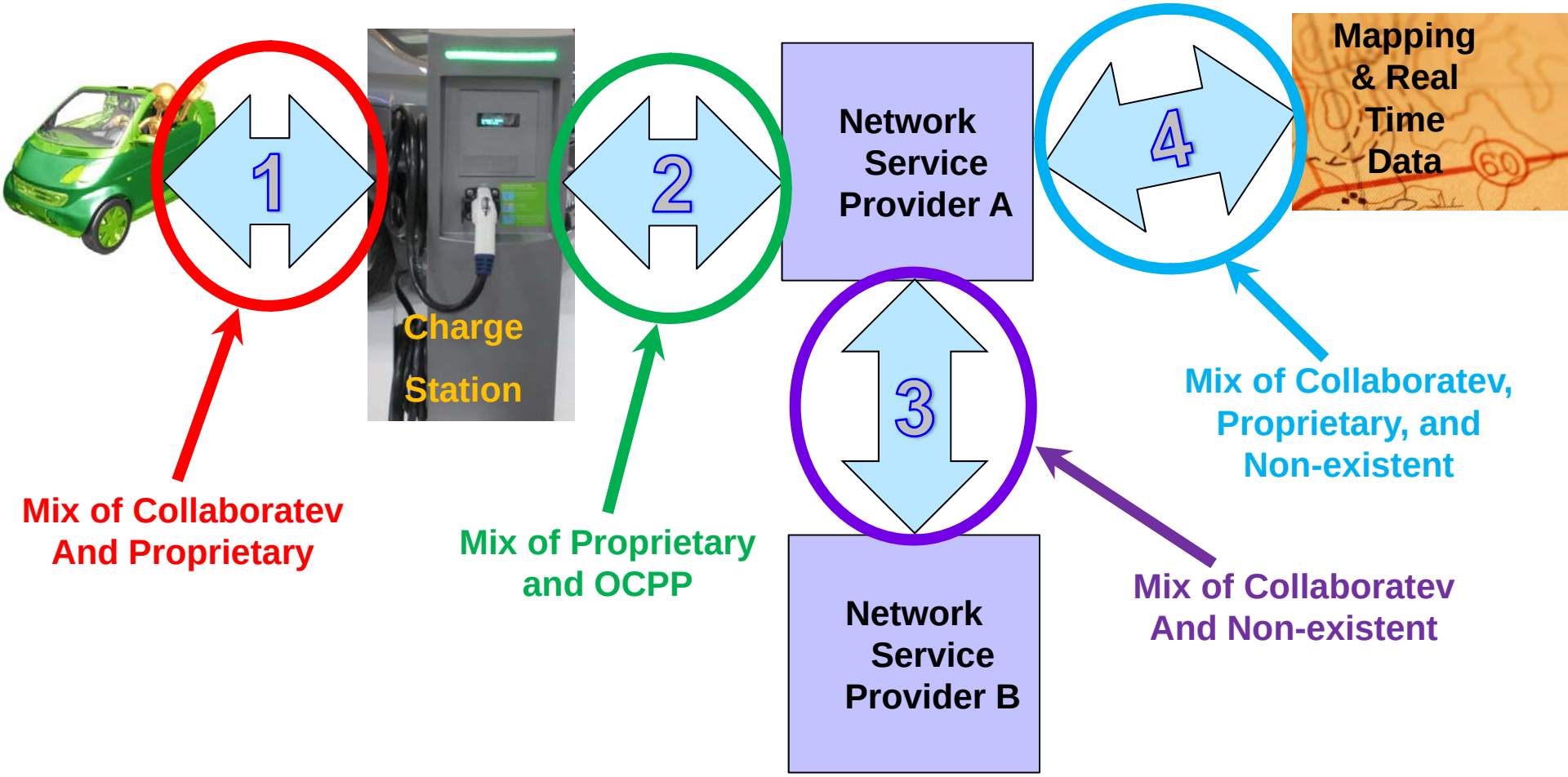
Where the market may go in the future…



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Summary

Proprietary Interfaces Lead To:	Interoperable Solutions
Consumers must carry multiple credentials	Standard Credential
	Inter-EVSP Solution
Consumers must belong to multiple networks	Inter-EVSP Solution
Fielded chargers locked to a particular network	Standard EVSE-EVSP Protocol
Charge stations forced to support multiple proprietary network protocols	Standard EVSE-EVSP Protocol
	Inter-EVSP Solution
Access to real-time data for mapping, reservations	EVSPs adopt a standard real-time data interface

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